Connecting to NERSC

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NERSC User Services Group
Outline: Connecting to NERSC

• ssh – the Secure Shell
  – The *lingua franca* of contacting NERSC

• NX - *Accelerated X* (also uses ssh)
  – Persistent sessions, Accelerated Graphics, KDE Desktop
ssh

• All of the computational systems at NERSC are accessible via ssh
• Each system has a set of load-balanced login nodes which offer ssh service
• Use your NIM username & password
• Addresses for NERSC systems:

<table>
<thead>
<tr>
<th>Large-scale Systems</th>
<th>Mid-range Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>– edison.nersc.gov</td>
<td>– genepool.nersc.gov</td>
</tr>
<tr>
<td>– hopper.nersc.gov</td>
<td>– pdsf.nersc.gov</td>
</tr>
</tbody>
</table>

Data Transfer Nodes

– dtn[1-4].nersc.gov

http://www.nersc.gov/users/network-connections/connecting-to-nersc/
Basic SSH use from Mac/Linux/cygwin

• If you have a UNIX-like computer, you can directly contact NERSC with your built-in ssh client
  1. Open a new terminal
  2. Enter: `ssh -l <NIM username> edison.nersc.gov`

• Depending on your preferences you might want additional ssh flags:
  • `ssh -Y` *performs robust X-forwarding over ssh*
  • `ssh -A` *forwards ssh-agent information (if you use ssh-keys)*

• **Advanced Topic: ssh keys**
  – If you choose to setup an ssh key to access NERSC systems, please use a passphrase on the key (*no unencrypted ssh keys!*)

SSH from a Windows System

- Many ssh clients exist for Windows
  - A very popular one is **putty**
    - [http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html](http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html)
  - Advanced users might prefer to use ssh directly within **mintty** (from cygwin distribution)

- **Both of these options support all ssh features (that I’ve ever tried to use)**
  - For X-forwarding to work, you’ll need to find X-server software
    - Cygwin/X
    - Exceed
  - Consider using NX instead of X-forwarding
Example Session

doe6933093:~ dmj$ ssh -l <NIM username> hopper.nersc.gov

*****************************************************************
*                                                               *
*                      NOTICE TO USERS                          *
*                      -------------------                          *
*                                                               *
* Lawrence Berkeley National Laboratory operates this computer system under contract to the U.S. Department of Energy. This computer system is the property of the United States Government and is for authorized use only. Users (authorized or unauthorized) have no explicit or implicit expectation of privacy.
* * Any or all uses of this system and all files on this system may be intercepted, monitored, recorded, copied, audited, inspected, and disclosed to site, Department of Energy, and law enforcement personnel, as well as authorized officials of other agencies, both domestic and foreign. By using this system, the user consents to such interception, monitoring, recording, copying, auditing, inspection, and disclosure at the discretion of authorized site or Department of Energy personnel.
* * Unauthorized or improper use of this system may result in administrative disciplinary action and civil and criminal penalties. By continuing to use this system you indicate your awareness of and consent to these terms and conditions of use. LOG OFF IMMEDIATELY if you do not agree to the conditions stated in this warning.
* * *
* Password: <enter your NIM password here>
Password: <enter your NIM password here>
Last login: Mon Aug 5 10:56:43 2013 from 128.55.19.61

NERSC Contacts http://www.nersc.gov/about/contact-us/
NERSC Status http://www.nersc.gov/users/live-status/
NERSC: 800-66-NERSC (USA) 510-486-8600 (outside continental USA)

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Compute Resources:
Carver:          Available.
Dirac:           Available.
Edison:          Available.
   Notes: (09/09/13 14:35 PDT) - Edison is reserved for dedicated
   science runs on 9/12 Thursday 18:00 PDT - 9/13 Friday 6:00 PDT.
Genepool:       Available.
Hopper:          Available.
   Notes: (09/09/13 8:51 PDT) - /scratch access issues are
   affecting some batch jobs. Engineers are investigating.
PDSF:            Available.

Global Filesystems:
Global Homes:    Available.
Global Scratch:  Available.
Project:         Available.
ProjectB:        Available.

Mass Storage Systems:
HPSS Backup:     Available.
HPSS User:       Available.

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----------------------------- Service Status as of 2013-09-09 14:35 PDT -----------------------------

All services are available.

----------------------------- Planned Outages -----------------------------

HPSS User:       09/11/13 9:00-13:00 PDT, Scheduled maintenance.
Data Transfer Nodes: 09/18/13 8:00-16:00 PDT, Scheduled maintenance.
   Maintenance on DTN01 thru DTN04.
Service:         09/22/13 22:00-09/23/13 2:00 PDT, Scheduled maintenance.
   The NERSC production instance of Service Now (Ticket System)
   will be down for an upgrade.

----------------------------- Past Outages -----------------------------

Carver/Dirac :   09/09/13 13:00-13:11 PDT, System in degraded mode.
                   Restarted Moab.

For past outages, see: https://www.nersc.gov/users/live-status/outage-log/

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Some NERSC systems won’t give you unlimited time on the login nodes
- After 48 hours idle, Hopper & Edison login nodes will terminate your session
- PDSF and Genepool session are unlimited
NX@NERSC – Accelerated X
Reasons for NX

• **Slow Speeds:** X-Windows is slow over network. Remote windows from emacs can take minutes to open

• **Solution:** NX Buffers/Compresses X messages, giving much better X experience
Reasons for NX

• **Long Lasting Desktop:** NX gives you a desktop, so you can connect to NERSC resources (such as edison) and start your GUI applications.
Reasons for NX

• **Lost Connections:** If I lose internet connection, I might lose all running processes.

• **Solution:** NX provides sessions. You can suspend the session without terminating the running processes.
  – And get back to the same point when reconnected, *even from a different location or computer.*
What you need for NX

- Any Desktop/Laptop
  - Windows/Linux/Mac
- NX Client Software (Free)
NERSC NX Service

• 10 Minute Start-up Guide

Documentation:
Go to www.nersc.gov, search for “NX”

Map of Current Users
X-forwarding through SSH
X-forwarding

- Allows you to access Visualization programs remotely at NERSC

Example:

```
localhost% ssh -l elvis -Y hopper.nersc.gov
...
e/elvis> module load vmd
e/elvis> vmd
<vmd starts up>
```

NERSC Recommends using NX instead of X-forwarding.

Next section!